

# **The Stormwater Utility Concept in the Next Decade (Forget the Millenium)**

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## **Abstract**

In the mid-1970's, the first stormwater utilities were viewed as novel innovations in a few western states. Today, just 25 years later, more than four hundred cities, counties, and special districts throughout the United States have established such utilities. The pace is accelerating, and the stormwater utility concept has moved from a novelty to a well-accepted management and funding approach. What will we see in the next decade?

The stormwater utility has been adapted to fit diverse stormwater management problems and needs across the United States. Program content, priorities, institutional and organizational structures, and rate methodologies have been tailored to fit local needs and municipal authority and practices that vary widely. Courts in several states, and even federal courts, have been engaged in resolving key issues, including but not limited to the legality of utility service fees and the use of other funding mechanisms.

Major changes in the concept are still emerging today. Stormwater quality has become a concern equal to flood control in many communities. The National Pollutant Discharge Elimination System Phase II stormwater permits have spurred a new round of interest in the stormwater utility concept among smaller communities. This is creating a demand for basic utility concepts suitable for small cities and towns, which will need to be less costly and simpler to implement and maintain. Concurrently, more large cities, urban and urbanizing counties, regional service agencies such as metropolitan sewer districts, and consolidated governments are investigating the utility approach. They will require more complex institutional and funding solutions.

Stormwater management itself is also changing rapidly. Interest and involvement in stormwater management have broadened. As combined sewer overflow programs, total maximum daily load (TMDL) negotiations, stormwater quality mandates, coastal zone management measures, and safe drinking water supply issues converge, more wastewater and even water supply utilities are engaging in stormwater management. Regional resource management programs, watershed-based master planning, multi-purpose cooperative efforts involving urban forestry and riparian corridor protection, and use of state revolving loan funds for stormwater quality projects are becoming more common.

Local programs are quickly evolving as well. They have become more comprehensive in scope, more costly, and more demanding of technical and administrative skills while the pool of resources has grown relatively slowly. Local governments are accepting responsibility for more components of the stormwater drainage systems or, in some cases, being forced to take on such responsibilities. Open streams, historic remnants or agricultural ditches and levees, and detention facilities are being included among the system components actively improved, operated, and maintained by local stormwater management agencies. A preventive orientation that minimizes problems is replacing reactive measures. Technology, such as geographical information systems and hydrologic and hydraulic modeling, is more widely available and more productive in support of stormwater management, even in smaller communities. Public involvement in decisions, policies, and even the operation of systems is increasing.

This paper examines these and other emerging trends that characterize where stormwater utilities are heading in the next decade.

## Pressures Moving us from Draining the Swamp to Stormwater Management

Historically, local drainage flooding, erosion, and water pollution due to stormwater runoff have not been high priorities for municipal governments. Unless homes, businesses, valuable agricultural land, or public properties have been devastated by flooding or other “drainage” problems, competing priorities have generally garnered more public concern and thus more support from elected officials. As a result, stormwater management operations, regulatory measures, and capital investment were historically ignored or, at best, received inadequate attention and erratic funding. Stormwater management has been a “stepchild” among municipal programs.

Symptoms of this past disregard are evident in many cities and counties.

- Improvements to stormwater systems in many communities have been limited to site-specific facilities installed by subdivision and commercial developers.
- Design practices have traditionally emphasized collecting and discharging runoff from each property as quickly as possible, without regard for downstream consequences.
- Public maintenance of stormwater systems has typically been reactive, and usually limited to road rights-of-way where uncontrolled stormwater might impact traffic safety, degrade the integrity of road surfaces, or threaten valuable adjacent properties.
- Maintenance of stormwater systems located outside of road corridors has commonly been left to private property owners, who are rarely capable of or willing to properly improve, clean, and repair such facilities.
- Municipal governments have usually improved and maintained individual structures or reaches instead of entire drainage systems, creating a patchwork of pieces having widely varying capacity and reliability.
- Failures of substandard components frequently impair the performance of otherwise adequate parts of the systems and damage properties near them.

As described by one municipal public works official, this stepchild is also the “sleeping giant” of unmet municipal infrastructure needs. Long-term stormwater remedial repair costs potentially exceed street and bridge repair needs in many older cities. Learning the high cost of correcting stormwater management deficiencies through master planning may have frightened as many local jurisdictions into inaction as it has spurred others. Perhaps the classic example is the stormwater master plan for Key West, Florida, which (in the early 1990’s) identified \$78 million in capital needs for that four square mile island community of less than 30,000 people.

Several factors are now changing local governments’ traditional orientation to stormwater management.

- Citizens’ service expectations are higher than in the past. In many cities and counties the number of citizen complaints about stormwater problems exceeds those about potholes in roads.
- Crumbling inlets and silt clogged ditches along roadsides spawn complaints even though they are on public property.
- Individual citizens or neighborhood associations no longer tolerate minor problems like localized flooding and channel erosion in backyards.

Environmental awareness in general is greater than in the past, and much more attention is being focused on stormwater impacts on receiving water quality in recent years.

- Stormwater management is now recognized as being part of an effective water resource protection strategy.
- Local concerns about acute threats of water pollution from spills and surreptitious dumping of toxic materials into stormwater systems are becoming more common.
- Phase II of the National Pollutant Discharge Elimination System (NPDES) stormwater permitting program is extending the program to smaller communities and those larger urban cities that escaped Phase I due to combined sewer service area exemptions.
- Programs proposed by local governments in NPDES Phase II permit applications will cost many thousands of dollars per year in cities, towns, and urban counties.

An encompassing, umbrella perspective of water resource management is emerging.

- Solutions to combined sewer overflow (CSO) problems will have to balance optimization of wastewater transport and treatment facilities against stormwater quantity and quality concerns.
- Several coastal states have instituted restrictive limitations on stormwater runoff to protect fragile estuaries and offshore waters from stormwater impacts.
- Drinking water supply watershed protection measures have imposed stormwater runoff regulations on developers independent of local stormwater management control practices.
- The point is becoming clear. Drinking water is water. Wastewater is water. Stormwater is water. Ground water is water. It is all WATER!

In the face of these pressures, the inadequacies of traditional stormwater management practices and funding are more widely recognized. More comprehensive and cohesive programs that address both stormwater quantity and quality are emerging. Clearly, however, the diversity of our communities and their problems and priorities means that no single solution is appropriate for every county, city, town, and village. Nor can a single funding method or stormwater utility rate structure fit every situation. Stormwater service fee methodologies can be designed to meet the specific needs of each community and provide equitable, adequate, and stable funding. The key is to tailor the funding to a clear program strategy.

### **“Stormwater Utility” can have Many Meanings**

The fact that the simple term “stormwater utility” obscures the various meanings it may encompass, results in many misunderstandings. The term may imply a funding and accounting method, an organizational approach, a management concept, or a combination of all these. In reality a “utility” provides an umbrella under which the financial, organizational, and management approaches of each local stormwater program can be orchestrated to achieve practical and efficient solutions. Responsibilities may be consolidated and focused. Substantial new funding may be generated. New technology, different management concepts, and upgraded support systems may be adopted. A comprehensive, preventive program may be instituted.

### **Changes in the Approaching Decade**

The spectrum of the stormwater utility concept will broaden more in the next 10 years than it has in the 25 years since the first utilities were established. The definition of “conventional” will change. Smaller towns and even villages will need to employ simpler variations of the concept. Larger cities, urban counties, consolidated governments, and coordinated regional approaches will demand more complex institutional, organizational, and funding solutions. The following are a few of the changes that may occur.

### ***NPDES Phase II Will Impact the Stormwater Utility Concept***

The findings of a survey of Phase II cities conducted by the National Association of Stormwater and Flood Management Agencies (NAFSMA) and published in July, 1999 indicate that 17% of all the respondent communities did not know how they would obtain funding to meet the stormwater regulations. Nearly half indicated they were not currently spending money on any of the stormwater program elements mandated by the regulations. Nearly three-quarters did not have a public information or education program as the regulations mandate. The 54% of respondents that currently fund programs or activities that fit the Phase II regulations on average spend upwards of \$4,000 per square mile, or about \$2.79 per capita. The implication seems clear that the NPDES Phase II program poses demands on local governments that may cause them to look to the stormwater utility concept to meet their stormwater quality program funding requirements.

The typical community that found the stormwater utility concept attractive in the past was a mid-size to larger city undergoing rapid development. Analyses of their stormwater management needs and programs typically revealed initial costs of service ranging from \$25,000/sq. mile to \$50,000/sq. mile annually. Costs per capita were typically \$10 to \$30 annually, with smaller cities trending toward the higher end of the range. In this context, the NAFSMA survey data is not

alarming. It suggests that the Phase II program costs will likely be in the neighborhood of five (5) to fifteen (15) percent of the typical cost of stormwater management at the outset of utility-based programs.

Given its cost implications, NPDES Phase II makes the stormwater utility concept attractive to a broader variety of cities, counties, towns, and villages. Many communities that do not suffer flooding or other drainage problems will find the revenue potential and flexibility of a utility service fee attractive in the face of NPDES permit requirements. This will result in utility approaches that are outside the current spectrum of our experience. The needs in individual small communities may be less diverse than in large cities and urban counties, but the range will be cumulatively broader among the communities involved in NPDES Phase II than in those that have implemented utilities previously.

New institutional arrangements and relationships will have to be devised. The “utility” concept will take on new forms. Use of interlocal agreements among several local jurisdictions will increase, with responsibilities in some cases concentrated in one entity capable of providing the range of services required or, conversely, allocated among several participants.

The limits of existing authorizing legislation in some states will be tested. Many states will need to adopt new legislation and amendments, giving local governments greater flexibility in dealing with their water resource management responsibilities. Courts in the various states, and perhaps even federal courts, will be challenged to arrive at some sense of continuity among the institutional and financial solutions characterized as “stormwater utilities.” Whether the court decisions will enable rather than hinder local governments’ efforts to comply with NPDES mandates is a key question.

Organizationally and financially independent stormwater utilities have been common to date. In the next decade more stormwater utilities will be integrated with other water resource programs: organizationally, through formalized working relationships, or through financial arrangements. Other resource management agencies and programs, including but not limited to health departments and growth management authorities, will demand a seat at the stormwater table.

As NPDES permitting is applied to smaller urban areas of less than 100,000 people, more of the regional wastewater and water utilities already serving those communities will assume stormwater management responsibilities. In some cases their involvement will be limited to water quality aspects. In others they will address both quantity and quality. Funding of stormwater management costs will simply be assumed by some of these existing utility agencies without changes in their rate methodologies. Others will establish independent stormwater cost centers and rate components to track spending and allocate costs. Some will even modify existing wastewater and/or water rate methodologies to better reflect the impact of stormwater control on costs of service.

As more small cities and counties seek to establish utilities, stormwaterfunding strategies and rate methodologies will need to minimize implementation costs, yet be more flexible to accommodate stormwater quality management costs and unique local needs. The urge to use a “cookbook” solution will cause some to adopt approaches that are poorly suited to their circumstances. The desire for more precision in service fee rate algorithms will lead to methodologies that give an illusion of greater refinement without actually achieving it.

The mandated involvement of smaller jurisdictions and more rural communities in stormwater management will spawn “paper utilities” established solely to generate added revenue. Most of these will be initiated without the foundation of a solid program strategy. Accountability will become a key issue in some of these communities within a few years. Political challenges based on accountability issues will cause some of these storm water utilities to be melded into other local agencies’ or programs or even dissolved entirely before they have geared up to address their program priorities.

Despite NPDES storm water permit mandates, locally perceived needs will still predominate in setting priorities. Flooding will remain a more important local issue than storm water quality. NPDES mandates will influence actual spending priorities only slightly. Few communities will need to institute a utility service fee just to support their NPDES Phase II programs, but many will justify it (at least partially) on that basis because it is easy to blame unfunded federal mandates for new local taxes, assessments, and service fees.

The technological resources and expertise required will change from the traditional engineering emphasis to a multi-disciplinary mix. More natural science and social science skills will be needed. Operational practices will change as new technology and information management systems enable innovative approaches and result in greater efficiency. Greater use will be made of outsourcing because of limited personnel resources and the high cost of specialized equipment.

### ***The Stormwater Utility Concept will Impact NPDES Phase II***

Local approaches to stormwater management will influence the content of Phase II permits and attainment of NPDES objectives. Stormwater utilities offer both financial capability and flexibility. Except in rare instances, stormwater utilities will not be established strictly to address stormwater quality and NPDES permit requirements. Rather, they will have a broader stormwater management perspective. For many communities this will mean that water quality management activities to comply with their NPDES permit will be tacked onto other stormwater efforts. NPDES Phase II permitting will, within a few years, adjust to accommodate this reality in terms of permit mandates, technical and scientific standards, and reporting requirements.

Related issues ranging from combined sewer overflow strategies to drinking water protection will be melded with Phase II permit requirements because they have to be. Local stormwater quality management cannot independently meet the entire range of regulatory expectations operating strictly by reference to NPDES Phase II. Conflicts and primacy battles will identify inconsistencies and gaps between the issues and programs, and will ultimately filter down to changes in NPDES Phase II program priorities and the permit requirements imposed on local governments. The unknown is whether this result in responsibility shifting toward bigger agencies with more resources and a broader perspective or toward local entities that have the ability to identify and activate locally acceptable solutions.

Watershed-based regulatory programs will overtake jurisdictional-based regulatory programs like NPDES Phase II. The utility approach will broaden to encompass watersheds through agreements among counties and cities simply because utility funding has the proven capacity to generate sufficient funding in politically acceptable ways. The transition has already begun in some areas. Where TMDLs affecting discharges of all sorts into receiving waters are an issue, they will supercede the six minimum practices identified for NPDES Phase II, making them essentially meaningless. Scientifically based, public health driven measures to protect drinking water supplies, estuaries, lakes, fisheries, and recreational beaches will overwhelm the programmatic approach represented by NPDES Phase II.

### ***You May Need a Program to Identify All the Players***

Stormwater utilities were first established because no one wanted responsibility for stormwater management. Those involved were concerned only about the impact of stormwater on their “real” jobs. The utility approach provided a way to focus responsibility and obtain dedicated, if not always adequate, funding for stormwater management. If there had been another option that was working, the stormwater utility concept probably would never have emerged.

A key issue in the next decade will be whether stormwater utilities will be major protagonists or bit players among all those now crowding onto the stage. More established and better-funded water and wastewater utilities now recognize that stormwater influences their operations directly and, in some cases, dramatically. For example, TMDL-based wastewater discharge limitations may severely curtail development in some areas. Will local wastewater utility administrators (and local elected officials) allow independent stormwater management utilities to address stormwater quality when economic vitality is at risk?

Other interests are becoming involved in stormwater management. Water supply utilities face the requirements of federal and state legislation regulating sources of supply and treatment. Coastal zone management has recognized that many priority uses of the shorelines and near-shore areas are dependent on good water quality. Growth management is an emerging concept, and concurrency of infrastructure improvements with development approvals highlights the issue of deficient stormwater systems in many communities. Protection of endangered and threatened species, urban forestry, and riparian corridor protection all have a relationship with stormwater management.

## ***The Walls Will Come Tumbling Down (or at least they better)***

The proliferation of federal, state, and local water resource (and related) regulations in recent years has created an environment in which dispersed responsibility for water in various forms and for various purposes is rapidly becoming unworkable. The institutional barriers that have been created over the past hundred years or so to focus attention, energy, and responsibility no longer fit the public needs. As watershed-scale studies, planning efforts, and the concept of TMDLs clearly illustrate, water resources are inextricably bound together regardless of their temporary form, use, and character.

The next decade will see accelerating consolidation of water resource management responsibilities at the local level of government. This is contrary to the control interests of some individuals and entities, and will not happen silently or easily. Will cities, counties, and special districts relinquish a little (or a lot) of their control over water resources through interlocal agreements? Will they accept a regional entity for water supply, wastewater treatment, stormwater management, or even water quality? What will be the effect on stormwater utilities?

What are the organizational implications of the coming changes in storm water management? Realistically, local governments change slowly. Public Works and Street Departments have historically been the lead organizations of storm water programs, but they rarely have had much involvement in water quality issues. If storm water quality begins to influence local priorities, it is more likely that water and wastewater utilities will assume storm water management responsibilities from Public Works and Street Departments than the reverse. Public Works agencies will have to upgrade their engineering and scientific capability or risk losing their storm water management role to water and wastewater utilities that are typically well-established, well-funded, and well-understood by the public.

## ***The Ability to Innovate Will Exceed the Need***

Most of the early stormwater utilities programs were rather narrowly focused, and the funding mechanisms supporting them were relatively simple. In recent years, however, there has been a shift toward more sophisticated and complex approaches to all aspects of stormwater management--from master planning to rate methodology design. Much of the credit goes to the explosive growth in information processing capability associated with the computer revolution of the past 20 years. It is not clear, however, that much of the added capability to innovate is necessary to meet stormwater management needs. This is not to suggest that opportunities to improve should be ignored simply because they are based on increasing capability to do so. The following examples demonstrate how the ability to innovate in stormwater through technology can run amok, and suggest how it should be managed to the benefit of people and the environment.

There is no substitute for understanding what is really important. One Southeastern United States city invested over \$1 million dollars assembling a highly detailed location inventory of its stormwater systems on a relatively sophisticated data processing platform. Unfortunately, the need for the inventory was not premised on a clear program strategy, nor was adequate funding available or established concurrently to support capital improvements or maintenance enhancements that could be facilitated by the inventory. The local elected officials finally tired of the seemingly mindless spending on the inventory and refused to discuss program improvements. Today, nearly 10 years later, the inventory has not been maintained and is out of date, and few improvements have been made in the stormwater management program.

What is technically possible does not always make common sense, and what makes sense is not always technically possible. A Northeastern city recognized that the stormwater component of its wastewater service fee rate methodology (one that was based on water meter size and internalized within its water/wastewater rates) was not reasonably allocating the cost of stormwater services and facilities across the community. Change to a more rational approach was desired, so a thorough assessment of the range of options was undertaken. A broadly representative advisory committee aided in the selection process. A relatively simple stormwater rate concept was selected that segregates stormwater funding from wastewater and water service. It will allocate a portion of the cost of stormwater service on the basis of gross area and a portion on the basis of impervious area. Once the impact of the change on certain rate payers was recognized, however, the advisory committee decided that phasing in the new rate over three years was a better idea than making the change in one step. While the technical support requirements of the phased approach are not especially demanding, the public information and education challenge is enormous. Not only must the new rate methodology explained to the public; it and the phase-in concept must be explained every year for three years.

## ***Errors by a Few Will Make Life Miserable for Many***

As the number of stormwater utilities grows, there is a natural tendency among municipal managers to assume that the process and results have become standardized, and the experiences of another community can simply be transferred. In an effort to save money, some cities and counties have established utilities without sufficient foundation and have even adopted service fee ordinances without the benefit of a cost of service analysis or a rate study. Such misjudgments have led to some monumental errors that have the potential to erode if not destroy the viability of the utility concept in a region, a state, or even nationally.

One city recently established a stormwater utility and adopted rates based on internal analyses that did not define a program, project the cost of service, or estimate the rate base available to generate revenue. As a result, the initial service fee billing was for nearly three times as much total revenue as the administration had indicated it hoped to raise for stormwater management. Furthermore, sufficient public information and education had not **been** conducted prior to the initial billing, so the public did not understand the purpose of the billing. A lawsuit was filed, and a same judgement on behalf of the plaintiff has resulted in the service fees being rescinded and revenues returned with interest.

## ***Expectations Will Advance Faster than Programs***

One common experience of the cities and counties that have established stormwater utilities is that public expectations for the program have exceeded the utility's ability to perform. This means that creating accurate expectations before a utility is established must be a high priority. One cause for unfulfilled expectations is that stormwater utility revenue streams are usually insufficient to address all the accumulated problems in a relatively short time. Initial stormwater utility service fees have typically been less than \$3 month for single-family residences.

Perhaps more significant, however, is the fact that most stormwater utilities inherit programs and systems that are not only deficient, but also do not offer an adequate foundation for a good, more comprehensive, program. Utilities often must invest one to three years creating the foundation for the program before real results begin to emerge in the form of capital improvements, remedial repairs, upgraded maintenance, and more effective regulations. Ratepayers tend to have little patience, however, when they are writing checks regularly to a stormwater utility.

In the context of NPDES Phase II permits, public expectations of improvements in water quality need to reflect the complexity of water quality issues and the limited ability of local government to quickly alter conditions in receiving waters through informational and regulatory programs. Attempting to sell a utility to a community as a response to federal water quality mandates has been unsuccessful in several communities. The public recognizes that stormwater quality, while important, is still a minor part of the total cost of stormwater management. Unless a comprehensive quantity and quality control program strategy is apparent, it is difficult to generate support for a stormwater utility.